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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/773,292

02/09/2004

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EXAMINER

ROMANO, JOHN J

ART UNIT

PAPER NUMBER

2192

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

01/25/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/773,292

Applicant(s)

CHOI ET AL.

Examiner

John J. Romano

Art Unit

2192

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 2/09/2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>See Continuation Sheet</u>                                    | 6) <input type="checkbox"/> Other: _____                          |

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :2/09/2004, 8/12/2004+ 9/29/2006.

### DETAILED ACTION

1. Claims 1-11 are pending in this action.

#### *Information Disclosure Statement*

2. The Information Disclosure Statements filed on February 9<sup>th</sup>, 2004, August 12<sup>th</sup>, 2004 and September 29<sup>th</sup>, 2006 have been considered.

#### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3, 7, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blais et al., US 7,065,743 (hereinafter **Blais**) in view of Sauntry et al., US6,349,344 (art of record & hereinafter **Sauntry**).

In regard to claim 1, **Blais**) discloses:

- "A system for shortening a class loading process in a Java program, comprising: a class loader unit for loading Java program class files from an auxiliary memory, performing...and initialization processes and generating runtime data..." (E.g., see Figure 4 & Column 7, lines 60-

Column 8, line 13), wherein the process begins upon class loading, wherein initialization processes and runtime information is generated.

- "...a first memory unit for maintaining the runtime data generated by the class loader unit in an accessible state..." (E.g., see Figure 1, element 120 & Column 6, lines 30-40), wherein the main memory stores the necessary runtime information and data that processor 110 may access.
- "...a second memory unit for storing the runtime data, which have been loaded into the first memory unit in the accessible state ..." (E.g., see Figure 3 (127) & Column 7, lines 19-31), wherein the cache is a second memory unit storing the already processed runtime data (analyzed program).
- "...a runtime data search unit for loading the runtime data, which have been stored in the second memory unit ... into the first memory unit upon the request of the class loader unit..." (E.g., see Figure 5 & Column 8, lines 42-44), wherein the runtime data search unit (cache processing mechanism, see Figure 1, element 129) determines if a class is stored in the runtime data (cache126).
- "...and an execution unit for executing the runtime data that have been loaded into the first memory unit in the accessible state." (E.g., see Figure 1 (110) & Column 5, lines 32-35), wherein a processor for executing the runtime data is disclosed.

But **Blais** does not expressly disclose "linking" or "storing in a form of images".

However, **Sauntry** discloses:

- "...linking..." (E.g., see Figure 3b (354) & Column 9, lines 54-60), wherein references are loaded.
- "...in the form of images..." (E.g., see Figure 1 (110) & Column 3, lines 2-3), wherein generated class files are stored as a run-time image.

**Blais** and **Sauntry** are analogous art because they are both concerned with the same field of endeavor, namely, managing java class files. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine **Saunttrys'** class file storing method with **Blais'** class file retrieval method. The motivation was provided by **Blais** in developing a method to overcome the shortcomings of java class file loading and parsing at run-time by a Java virtual machine so that Java programs may realistically be more able to run on memory-constrained platforms (see Column 2, lines 58-63).

In regard to claim 3, the rejections of base claim 1 are incorporated.

Furthermore, **Blais** discloses:

- "...the runtime data search unit causes the runtime data generated by the class loader unit to be stored in the second memory unit..." (E.g., see Figure 5 (532) & Column 8, lines 64-66), wherein the program information is stored in the cache.

In regard to claim 7 see claims 1.

In regard to claim **9**, the rejections of base claim **6** are incorporated.

Furthermore, **Blais** discloses:

- "...if it is determined from search results of the requested runtime data for the Java program that there are no relevant runtime data, loading Java program class files from an auxiliary memory..." (E.g., see Column 3, lines 20-23), wherein if there is no entry in the cache corresponding to the class the program information is analyzed and saved in a cache entry for future use.

See claim **1** for the remaining limitations.

In regard to claim **10**, the rejections of base claim **9** are incorporated.

Furthermore, **Blais** discloses:

- "...the step of storing the generated runtime data..." (E.g., see Figure 4 & Column 9, lines 31-36), wherein.

But **Blais** does not expressly disclose "*performed after the step of executing the runtime data transmitted to the first memory unit*". However, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to perform the storing step after execution rather than before as disclosed by **Blais**. The motivation to do so is that it is old and well known in the art to execute code steps in different order, particularly when the result (e.g., storing and executing) is the same and not effected by the order of execution. Accordingly, **Blais'** disclosure of storing and then executing the runtime information produces the same result as executing and then storing. Thus, storing after execution would have been obvious to one of ordinary skill in the art.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Blais**.

In regard to claim 6, **Blais** discloses:

- "...a runtime data search unit to search runtime data necessary for execution of the Java program, by a class loader unit;; ..." (E.g., see Figure 5 & Column 8, lines 42-44), wherein the runtime data search unit (cache processing mechanism, see Figure 1, element 129) determines if a class is stored in the runtime data (cache 126).
- "...searching the requested runtime data for the Java program by the runtime data search unit ..." (E.g., see Figure 5 (522) & Column 8, lines 56-58), wherein the cache is searched.
- "...transmitting the searched runtime data to a first memory unit; and executing the runtime data transmitted to the first memory unit." (E.g., see Figure 5 (526) & Column 8, lines 58-60), wherein the analyzed program information is read from the cache entry (step 526) and used (step 528).

But **Blais** does not expressly disclose "requesting" the cache processing mechanism 129 (runtime search unit) to search. However, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, that a needed class is equivalent to requesting the class, as it would be necessary to request a needed class in order to receive it.



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5. Claims **2, 4, 5, 8** and **11** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Blais** in view of **Sauntry** and further in view of Rodriguez et al., US 6,725,241 (hereinafter **Rodriguez**).

In regard to claim **2**, the rejections of base claim **1** are incorporated. But **Blais** and **Sauntry** do not expressly disclose "...a garbage collector unit for collecting space unused in the first memory unit and allowing the unused space to be used again."

However, **Rodriguez** discloses:

- "...a garbage collector unit for collecting space unused in the first memory unit and allowing the unused space to be used again." (E.g., see Figure 4 & Column 3, lines 45-67), wherein a garbage collection unit for allowing unused space to be used again is disclosed.

**Blais, Sauntry** and **Rodriguez** are analogous art because they are both concerned with the same field of endeavor, namely, managing java virtual machine memory. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine **Sauntrys'** garbage collector via least recently used method with **Blais and Sauntrys'** class file retrieval method. The motivation was provided by **Blais'** teaching to overcome the shortcomings of java class file loading and parsing at run-time by a Java virtual machine so that Java programs may realistically be more able to run on memory-constrained platforms (see Column 2, lines 58-63). Further motivation was provided by **Rodriguez's** disclosure of freeing memory in native method stacks (see Figure 2, 212 & Column 4, lines 30-33).

In regard to claim **4**, the rejections of base claim **1** are incorporated. But **Blais** and **Sauntry** do not expressly disclose "...by using a least recently used (LRU) method." However, **Rodriguez** discloses:

- "...by using a least recently used (LRU) method." (E.g., see Figure 4 & Column 3, lines 45-67), wherein a garbage collection unit for allowing unused space to be used again via the least recently used method is disclosed.

In regard to claims **5**, **8** and **11**, see claim **4**.

### **Conclusion**

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Meuller et al., US 6,584,612 discloses a method for loading class files stored as images from a platform with limited memory from ROM.
- Fresko et al., US 5,966,702 discloses a method for pre-processing and packaging class files.
- Dolby et al., "An Automatic Object Inlining Optimization and its Evaluation" discloses memory management.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J. Romano whose telephone number is (571) 272-3872. The examiner can normally be reached on 8-5:30, M-F.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam can be reached on (571) 272-3695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JJR



TUAN DAM  
SUPERVISORY PATENT EXAMINER